Name: Date:

Polynomial Factoring solution (version 681)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 10x + 39 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(10) \pm \sqrt{(10)^2 - 4(1)(39)}}{2(1)}$$

$$x = \frac{-(10) \pm \sqrt{100 - 156}}{2(1)}$$

$$x = \frac{-10 \pm \sqrt{-56}}{2}$$

$$x = \frac{-10 \pm \sqrt{-4 \cdot 14}}{2}$$

$$x = \frac{-10 \pm 2\sqrt{14}\, i}{2}$$

$$x = -5 \pm \sqrt{14}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $9 + 3i$ and $2 + 5i$ in standard form $(a + bi)$.**

Solution

$$(9 + 3i) \cdot (2 + 5i)$$

$$18 + 45i + 6i + 15i^2$$

$$18 + 45i + 6i - 15$$

$$18 - 15 + 45i + 6i$$

$$3 + 51i$$

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3. **Write function $f(x) = x^3 + 8x^2 + 19x + 12$ in factored form. I'll give you a hint: one factor is $(x + 4)$.**

Solution

	1	8	19	12
-4		-4	-16	-12
	1	4	3	0

$$f(x) = (x + 4)(x^2 + 4x + 3)$$

$$f(x) = (x + 4)(x + 1)(x + 3)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x + 4) \cdot (x - 1) \cdot (x - 5)^2$$

Sketch a graph of polynomial $y = p(x)$.